REFRIGERATOR MANUFACTURER

Turbo air

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REFRIGERATOR MANUFACTURER

Turbo air

Commercial Refrigerator & Freezer Service Manual

Solid Door

Model No. : TSR-23SD

TSR-35SD

TSR-49SD

TSR-72SD

TSF-23SD

TSF-35SD

TSF-49SD

TSF-72SD

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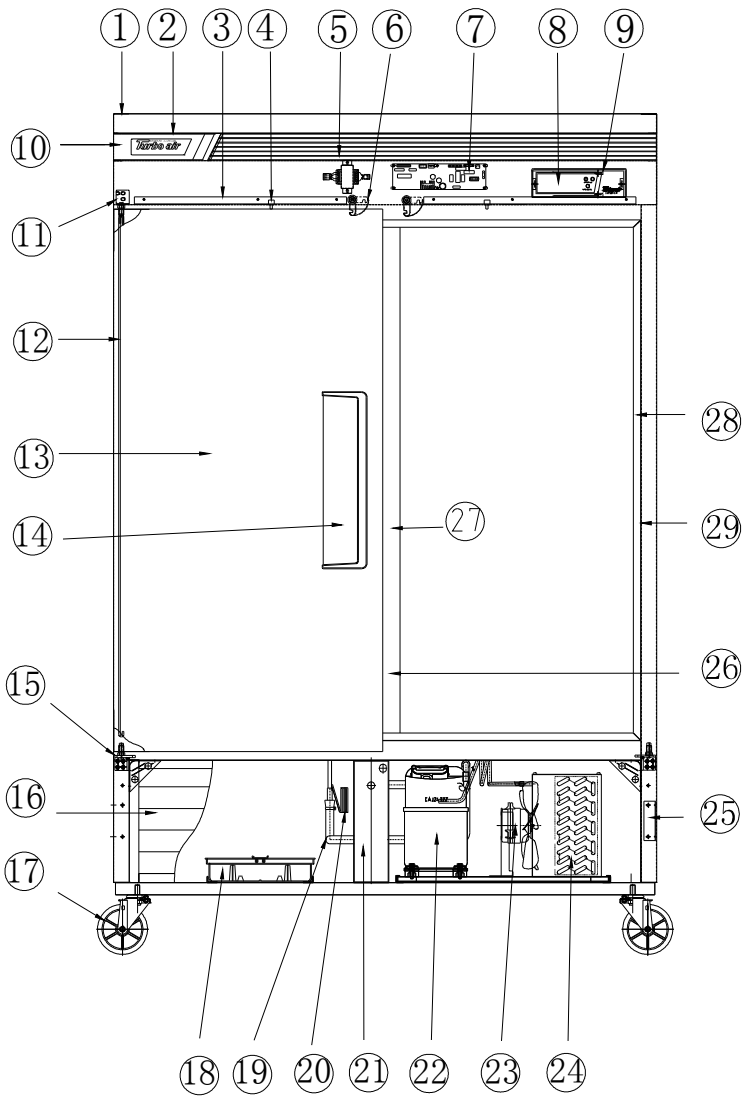

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FEATURE CHART

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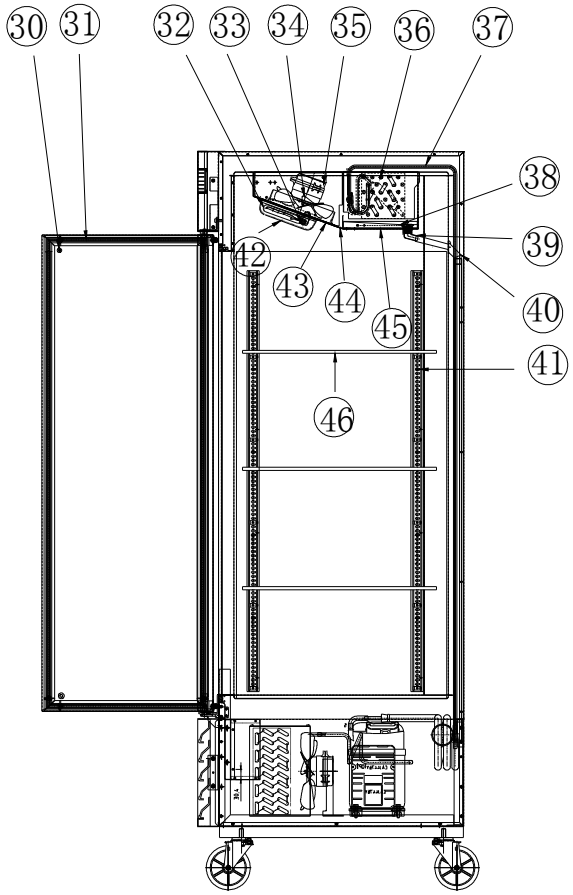

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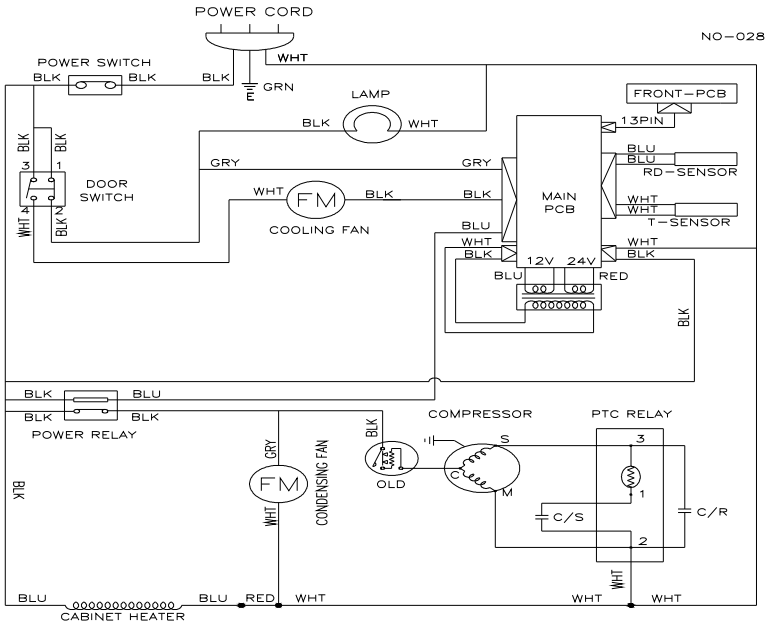
2.WIRING DIAGRAM

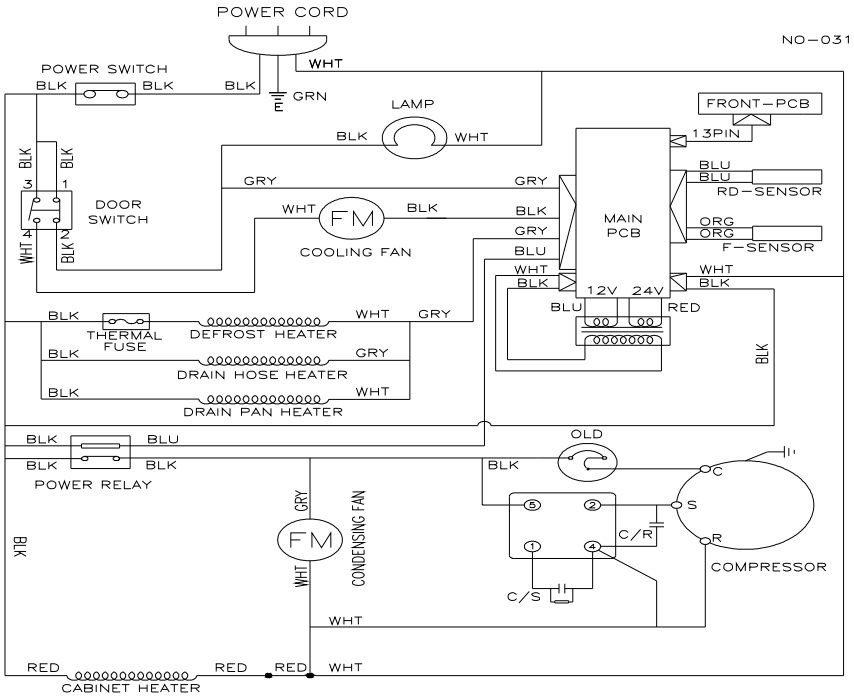
2-1 TSR-23SD

WIRING DIGRAM



2-2 TSF-23SD

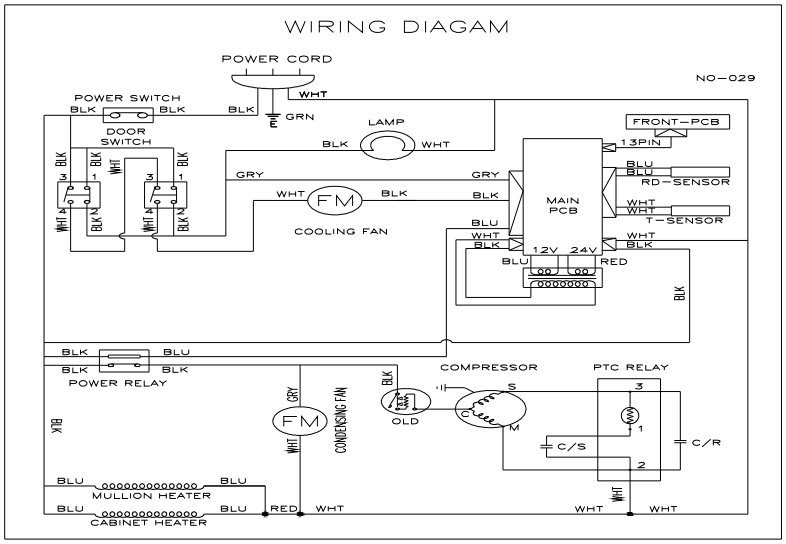
WIRING DIGRAM



WIRING DIAGRAM

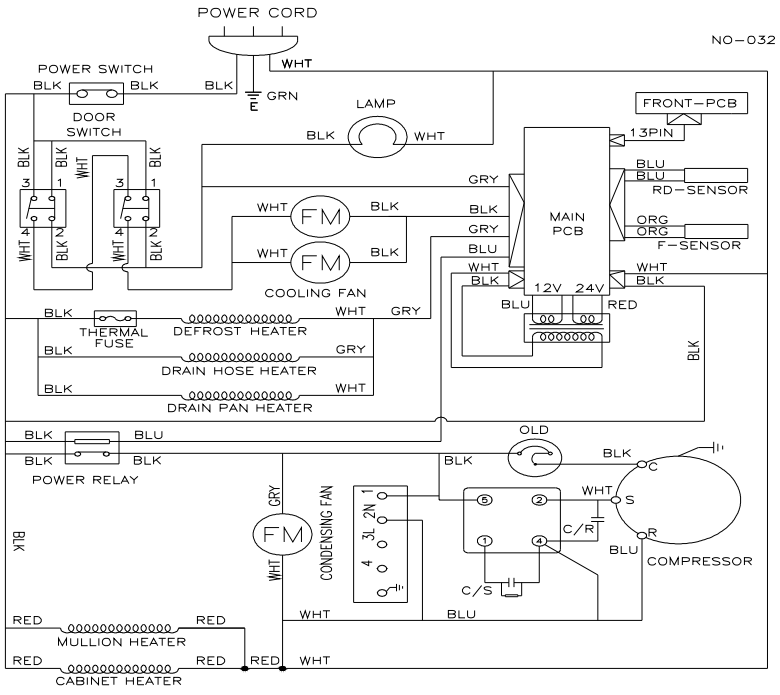
2-3 TSR-35SD

WIRING DIGRAM



2-4 TSF-35SD

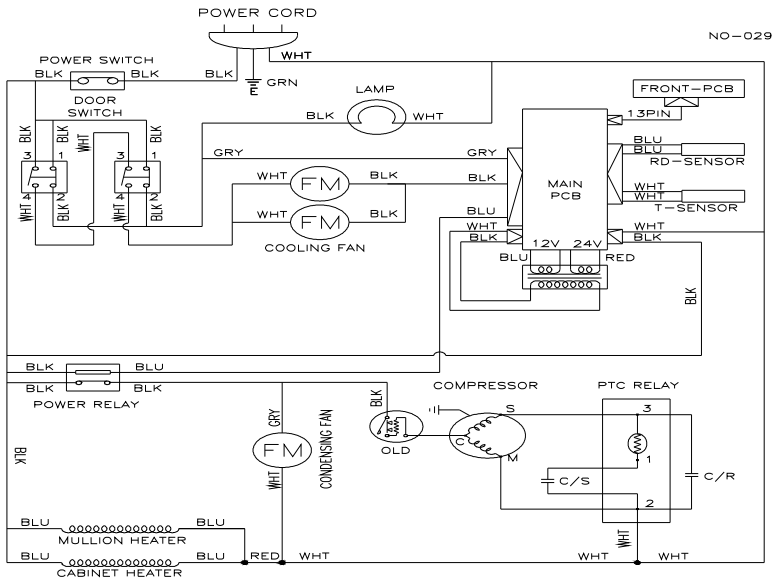
WIRING DIGRAM



WIRING DIAGRAM

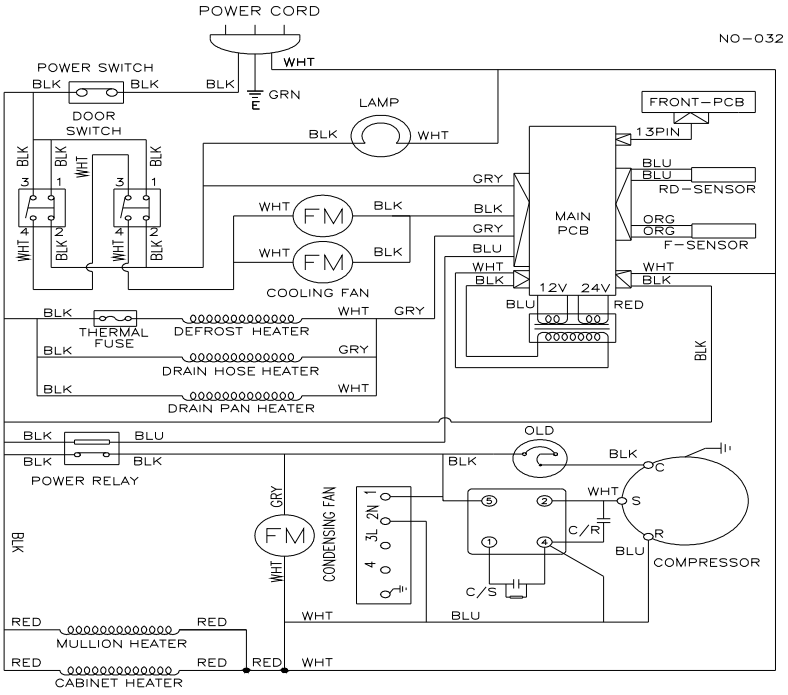
2-5 TSR-49SD

WIRING DIGRAM



2-6 TSF-49SD

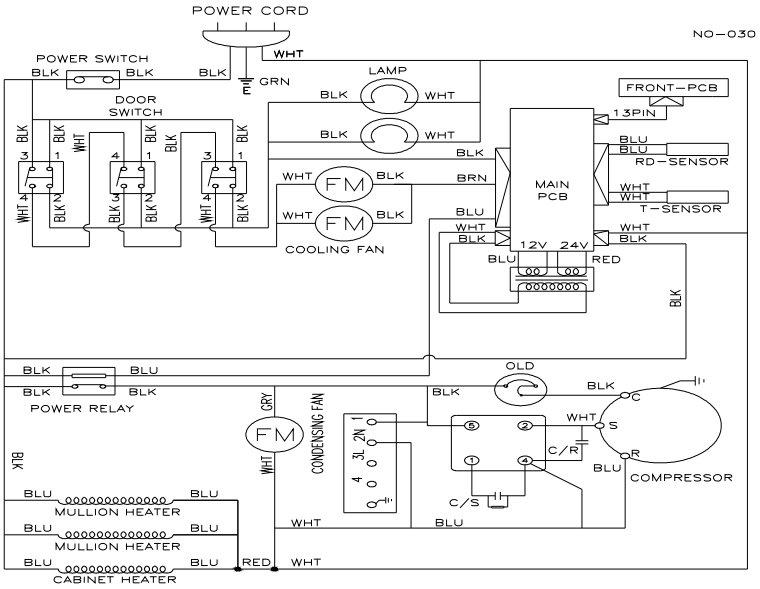
WIRING DIGRAM



WIRING DIAGRAM

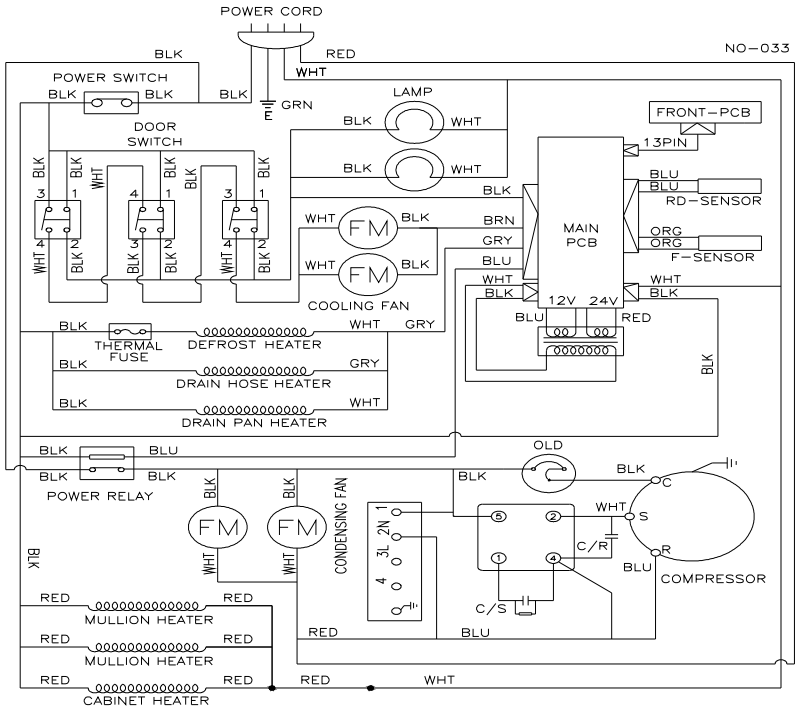
2-7 TSR-72SD

WIRING DIGRAM



2-8 TSF-72SD

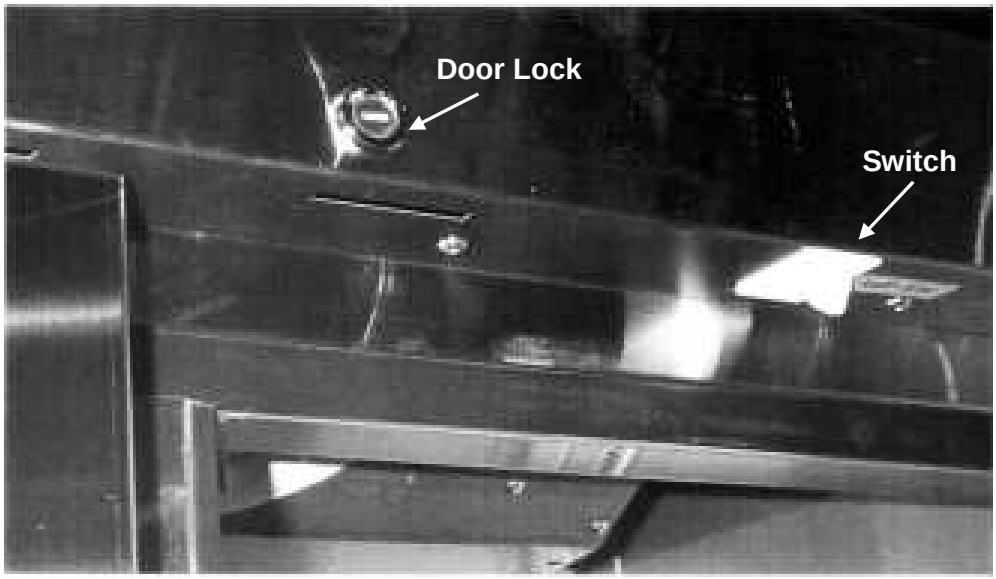
WIRING DIGRAM



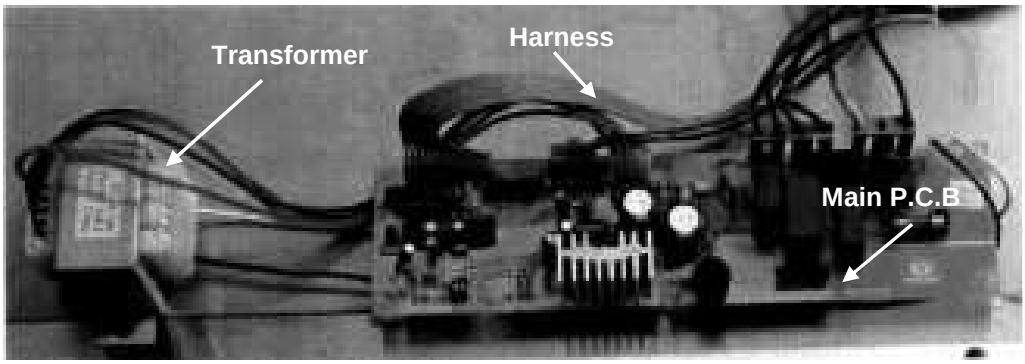
3.PART DETAIL

3-1. TOP GRILLE

Door Lock, Switch

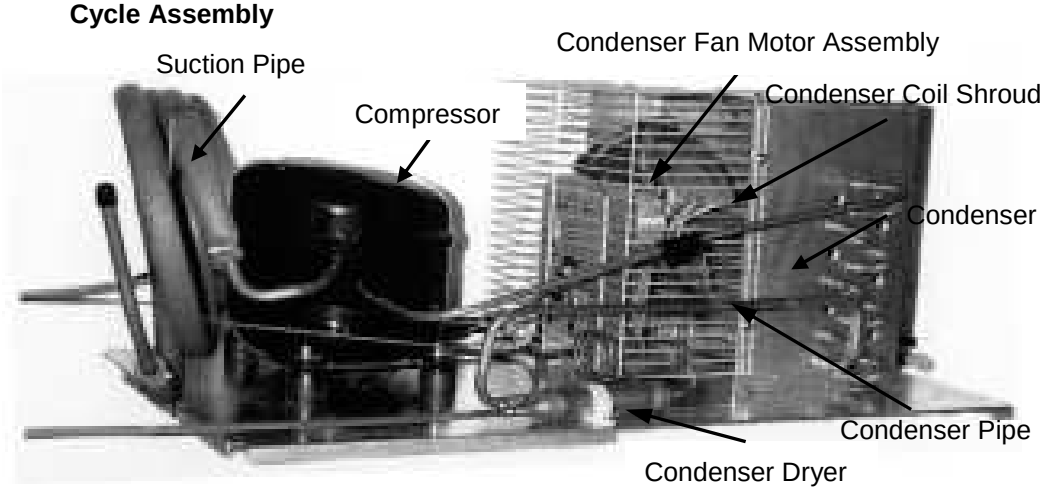


Transformer, Main P.C.B



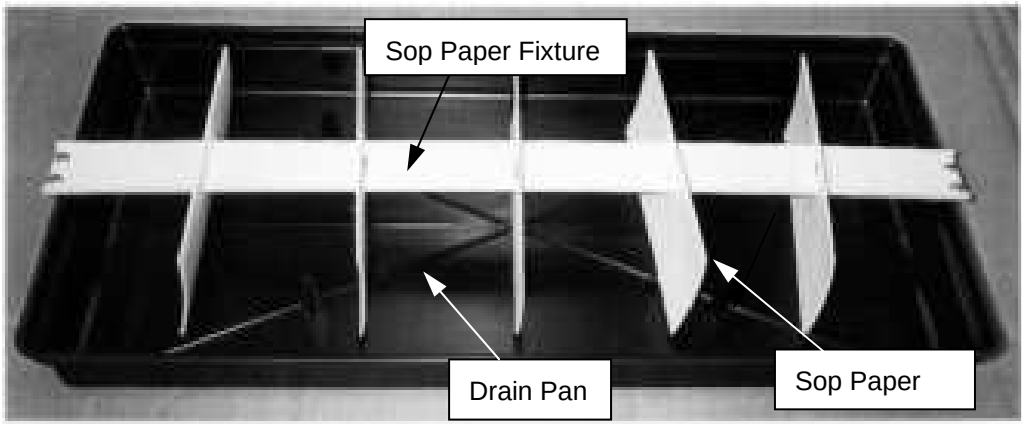
3-2. Refrigeration Compartment

Cycle Assembly

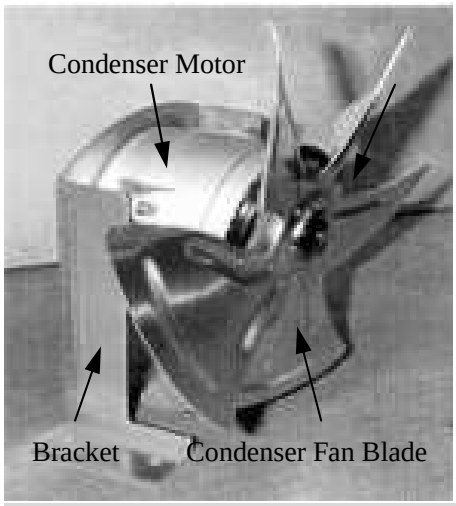


PART DETAILS

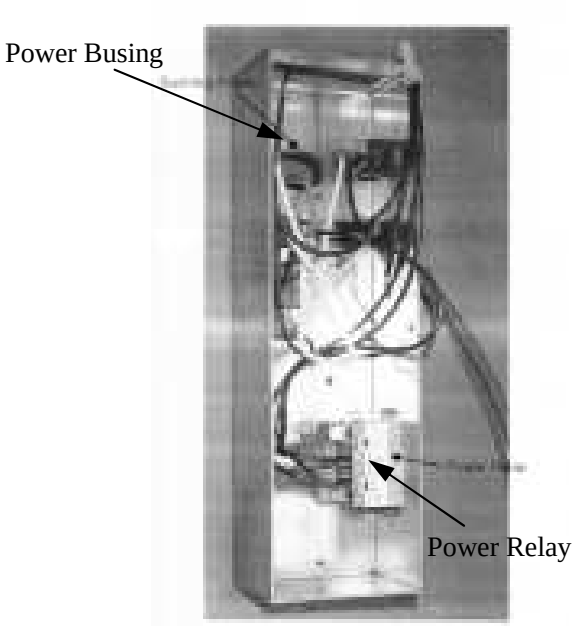
Drain Pan Assembly



Condenser Fan Motor Assembly



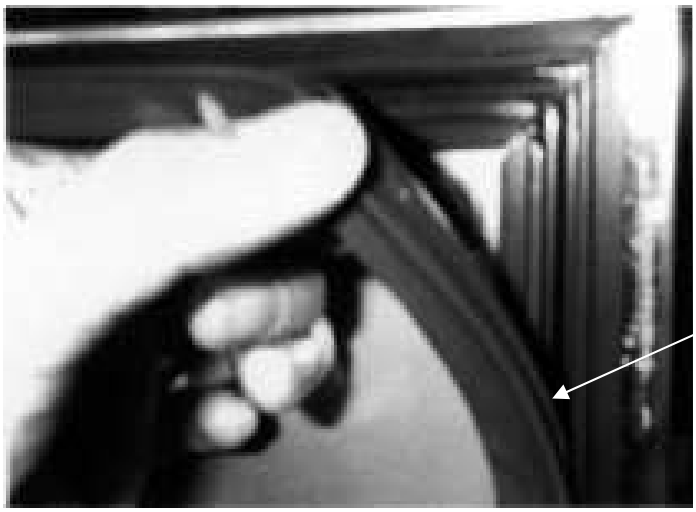
3-3. Electrical Box



PART DETAILS

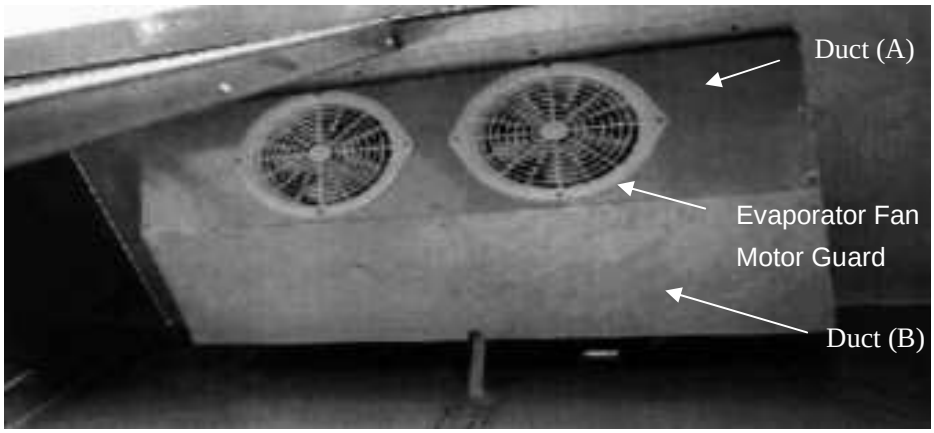
3-4. Door

Gasket

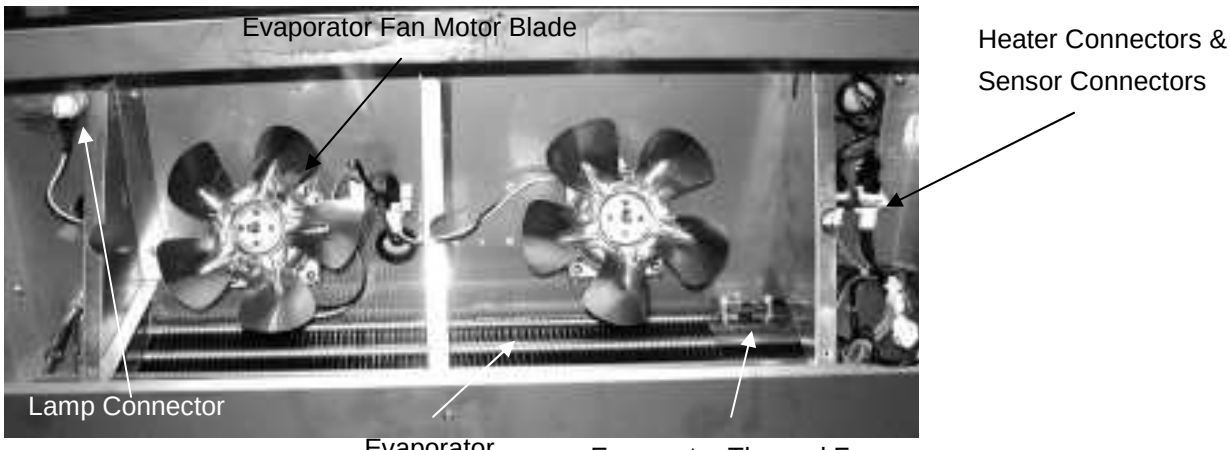


3-5. Cooling Compartment

Freezer Duct & Refrigerator Duct (TSR-35SD,TSF-35SD,TSR-49SD, TSF-49SD, TSR-72SD, TSF-72SD Type)

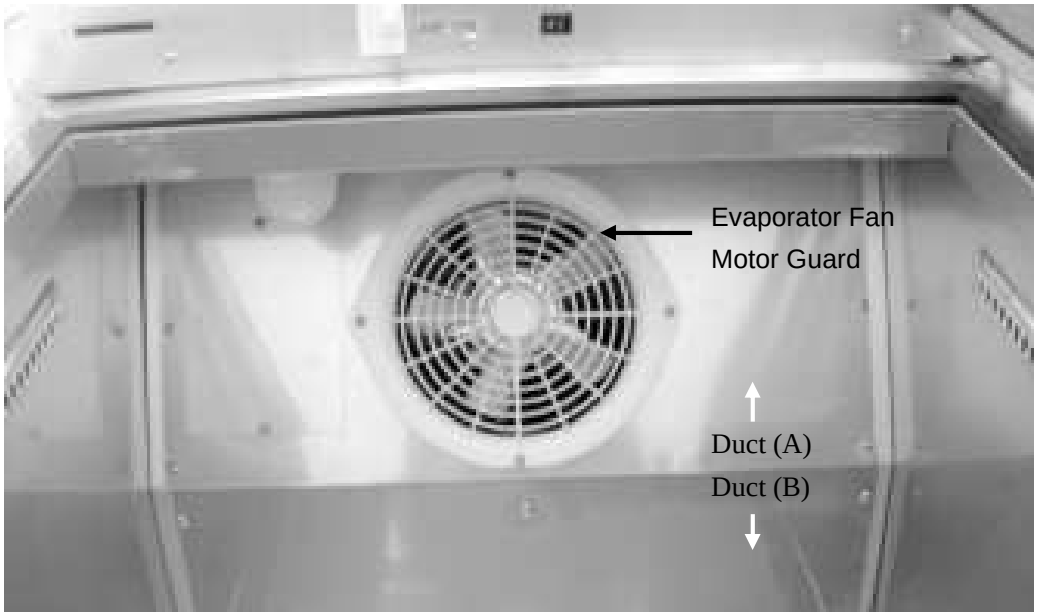


Freezer Evaporator, Fan (TSF-49SD, TSF-72SD)

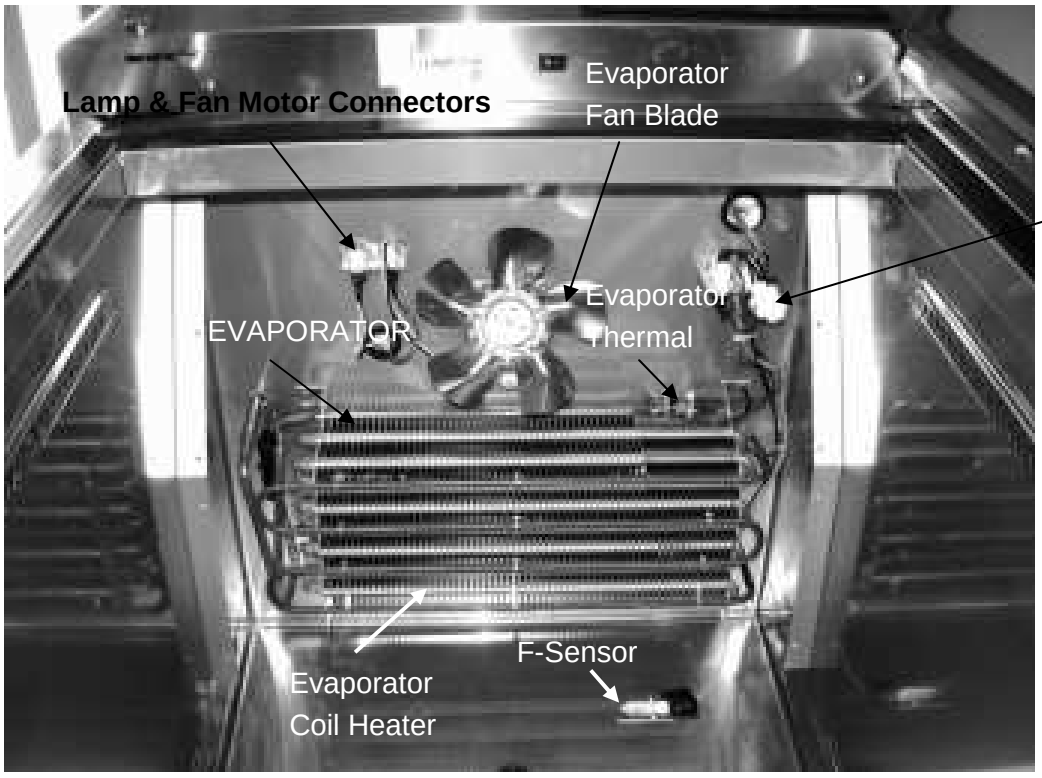


PART DETAILS

Freezer Duct & Refrigerator Duct (TSR-23SD, TSF-23SD Type)



Freezer Evaporator, Fan (TSF-23SD)



4. MAIN COMPONENTS

4-1.COMPRESSOR

Model	TSR-23SD	TSR-35SD	TSR-49SD	TSR-72SD	TSF-23SD	TSF-35SD	TSF-49SD	TSF-72SD
Refrigerant	R-134a				R-404a			
Voltage	115V/60HZ							208/230
Comp Model	HBL27YE-1	SK1A1C-L2W	SK1A1C-L2W	CAJ4476YC	CAE2420Z	CAJ2432Z	CAJ2432Z	CAJ2446Z
Part code	M369700100	M609700100	M609700100	P8R5700100	G2F5700100	P2F5700100	P2F5700100	P5F5700100
Starting Type	CSR	CSR	CSR	CSIR	CSIR	CSR	CSR	CSR

4-2.COMPRESSOR RELAY

Model	TSR-23SD	TSR-35D	TSR-49SD	TSF-23SD	TSF-35SD	TSF-49SD	TSR-72SD	TSF-72SD
Voltage	115v/60HZ							220V/60HZ
Relay Model	783RHBZZ-52	795TFBZZ-53	795TFBZZ-53	MST16AHN-3240	GA3PJU0016	GA3PJU0016	CRA38014-3057	CRA38012-3057

4-3.CONDENSER DRYER

Model	TSR-23SD	TSF-23SD	TSR-35SD	TSF-35SD	TSR-49SD	TSF-49SD	TSR-72SD	TSF-72SD
Refrigerant	R-134a	R-404a	R-134a	R-404a	R-134a	R-404a	R-134a	R-404a
Spec.	C-052-S							
Part code	M726800100							

4-4.CAPACITOR

Model	TSR-23SD	TSR-35SD	TSR-49SD	TSF-23SD	TSF-35SD	TSF-49SD	TSR-72SD	TSF-72SD
Voltage	115V/60HZ							220V/60HZ
Running	115V/60HZ		X	X				
Part code								
Starting	200V/100uf	200V/10 ㎌	125V/12 ㎌	160V/60Hz/ 315uF-0+20%	160V/60Hz /315uF-0+20%	160V/315uF -0+20%	160vac/250uF -0+20%	250V/50Hz/ 88uF-0+20％
Part code								

MAIN COMPONENTS

4-5.EVA FAN MOTOR

Model	TSR-23SD	TSR-35SD	TSR-49SD	TSF-23SD	TSF-35SD	TSF-49SD	TSR-72SD	TSF-72SD
Voltage	115V/ 60Hz							
Motor Model.	IS-4420DWSN-2A(CW) (43W)							
Part code	P8F6600100							

4-6.CONDENSOR FAN MOTOR

Model	TSR-23SD	TSR-35SD	TSR-49SD	TSF-23SD	TSF-35SD	TSF-49SD	TSR-72SD	TSF-72SD
Voltage	115V, 60Hz							220V, 60Hz
Motor Model.	IS 4420DWSG-1							4420DWSQ-1
Part code	G8F6600100							G8F6600200

4-7.EVA DEFROST HEATER

Model	TSR-23SD	TSR-35SD	TSR-49SD	TSF-23SD	TSF-35SD	TSF-49SD	TSR-72SD	TSF-72SD
Voltage	115V/60HZ							
Spec..	X	X	X	445W	535W	600W	X	900W
Part code	X	X	X	T2F5300300	T3F5300100	T5F5300300	X	T8F5300500

4-8.LAMP

Model	TSR-23SD	TSR-35SD	TSR-49SD	TSF-23SD	TSF-35SD	TSF-49SD	TSR-72SD	TSF-72SD
Voltage	120V/60HZ							
Spec..	40W							
Part code	P996300100							

4-9.PCB TRANSFORMER

Model	TSR-23SD	TSR-35SD	TSR-49SD	TSF-23SD	TSF-35SD	TSF-49SD	TSR-72SD	TSF-72SD
Voltage	115V/60HZ							
Spec..	DWG-115V							
Part code	P996000100							

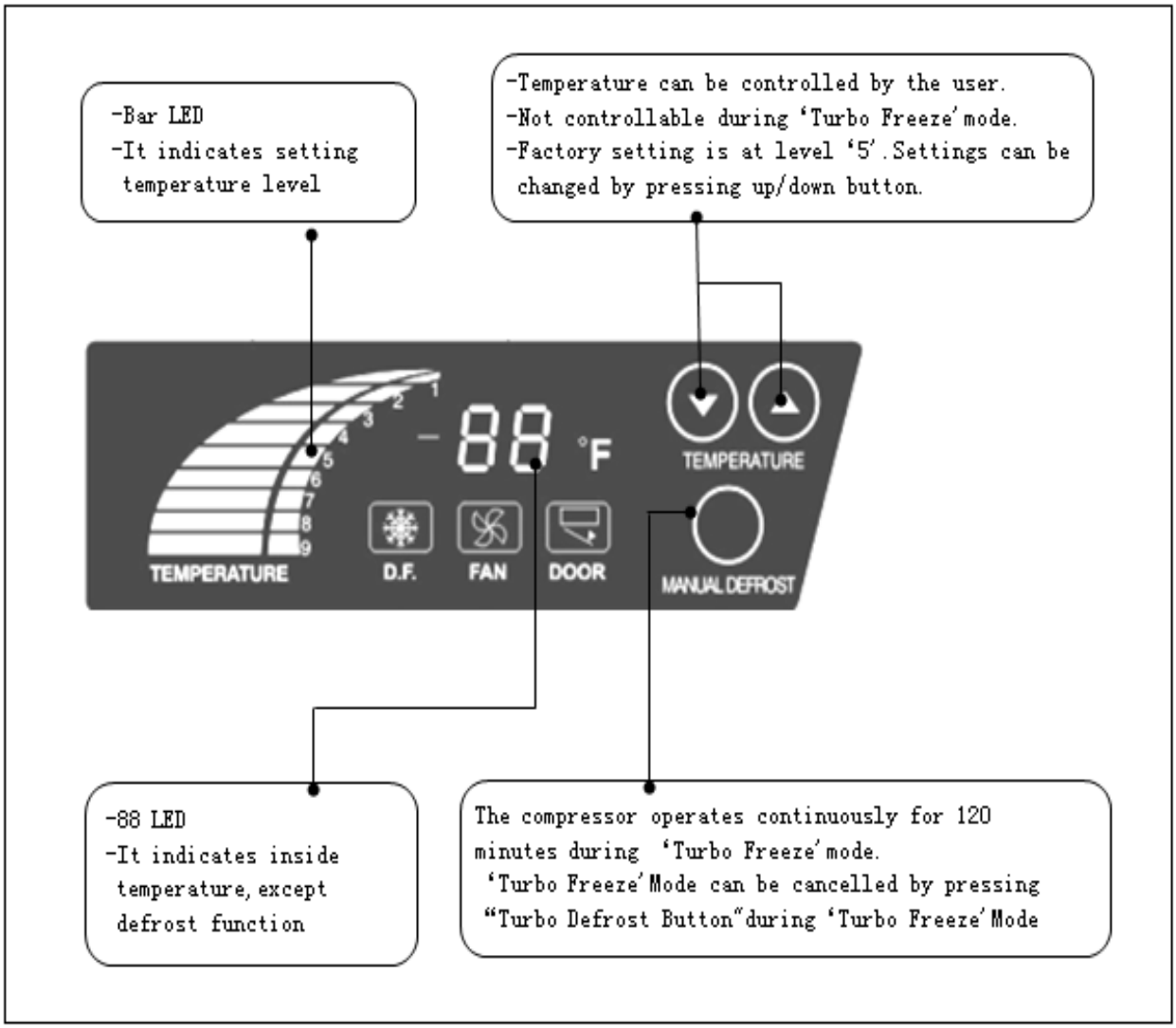
4-10.MAIN PCB

Model	TSR-23SD	TSR-35SD	TSR-49SD	TSR-72SD	TSF-23SD	TSF-35SD	TSF-49SD	TSF-72SD
Voltage	115V/60HZ							
Spec..								
Part code	P8R5400100				P8F5400100			

5. ELECTRONIC CONTROLLER INSTRUTION

5-1.FREEZER CONTROLLER

5-1-1.HOW TO USE THE PANEL



ELECTRONIC CONTROLLER INSTRUCTION

5-1-2.FUNCTION TABLE

NO	FUCTION	Controlled Part	Description
1	Initial Operation	Buzzer, Fan Or Door lamp Bar LED 88LED	1.Buzzer will ring 2 sec. after Plug-In. 2.88LED displays inside temperature. 3.Compressor runs immediately ,if evaporator temperature is higher than 38.3° F(3.5° C).Compressor will run 3 minutes after plug-in, if eva. temp. is lower than 38.3° F(3.5° C).
2	Tempera-ture Control	Compressor F-fan C-fan LED	1.The temperature can be changed by pushing up/down buttons. 2.88LED displays inside temperature . 3.Buzzer buzzes 1 time whenever a button is pressed. 4.Compressor automatically turns on and off by F-sensor(Except error mode)
3	Turbo Freeze	Compressor F-fan C-fan LED	1.If Turbo Freeze button is pressed, Turbo Cooling mode will start. 2.If the Turbo Freeze button is pressed during Turbo Freeze mode, Turbo Freeze mode can be canceled. 3.During Turbo Freeze mode, the temperature control button will not affect the temperature control. 4.All bar LEDs are fully lighted during Turbo Freeze mode.  *NOTE* F-sensor: Thermistor (Electrical resistance varies with temperature changing) Act Like thermostat. Detect air temp. Wire color is orange. D-sensor: Thermistor Act like defrost terminator. Wire color is blue.

ELECTRONIC CONTROLLER INSTRUCTION

<table>
<tr><th>NO</th><th>FUCTION</th><th>Controll Part</th><th>Description</th></tr>
<tr><td>4</td><td>Defrost Function</td><td>Heater
com-
pressor
F-fan
C-fan</td><td>1.Defrost function is controlled by time interval setting.
2.Time interval can be set by shifting dip s/w on the PCB.
3.Time interval setting is as follows.

Dip Switch Cycle time
No.1 No.2 (hours)
0 0 12
1 0 10
0 1 8
1 1 6
4.Factory setting is 6 hours
5.The first defrost function will start at the half value of setting time.</td></tr>
<tr><td>5</td><td>Forced Defrost</td><td>Comp
F-fan
C-fan
Heater</td><td>a. Press and hold up/down button and press turbo freeze button 5 time</td></tr>
<tr><td>6</td><td>Comp Restart Prevent</td><td>Comp
C-fan</td><td>1. After comp. is off, comp. will not start for 3 min, even though the F-sensor is at point.</td></tr>
<tr><td>7</td><td>Power Failure Back-Up Function</td><td>Comp
F-fan
C-fan</td><td>1. Compressor will not start for 3 min. after power failure.
2. F-fan is on.</td></tr>
<tr><td>8</td><td>Door opening Alarm func-tion</td><td>Buzzer
LED</td><td>1. If door is opened , fan goes off and lamp on.
2. If door is opened for more than 30 seconds, chirpy sound alarm buzzes 3 time.
3. If door is opened for more than 60 seconds, chirpy sound alarm buzzes 5 time.
4. If door is opened for more than 5 minutes ,chirpy sound alarm buzzes continuously</td></tr>
<tr><td>9</td><td>Buzzer Function</td><td>Buzzer</td><td>1. Alarm buzzers 1 time after initial power on.
2. Alarm buzzers whenever each button is pressed.
3. Alarm buzzers if door remains open for certain period.(See door opening alarm function).</td></tr>
<tr><td>10</td><td>Error Display</td><td>LED</td><td>1. If inside temp. is lower than -50° F or higher than 69,88LED indicates ‘Lo’ or ‘Hi’ respectively.
2. Press ‘up’ button 5 times with pressing and holding both ‘down’ button and ‘Turbo Cooling’ button .Above procedure switches normal display mode.
3. If there was no error occurred before, there will be no change on the 88 LED. If there was any error occurred before ,there will display error code.
4. Next error code will be displayed by pressing down button.
5. 10 seconds after the last button pressed, error display mode will be switch to normal display mode.</td></tr>
</table>

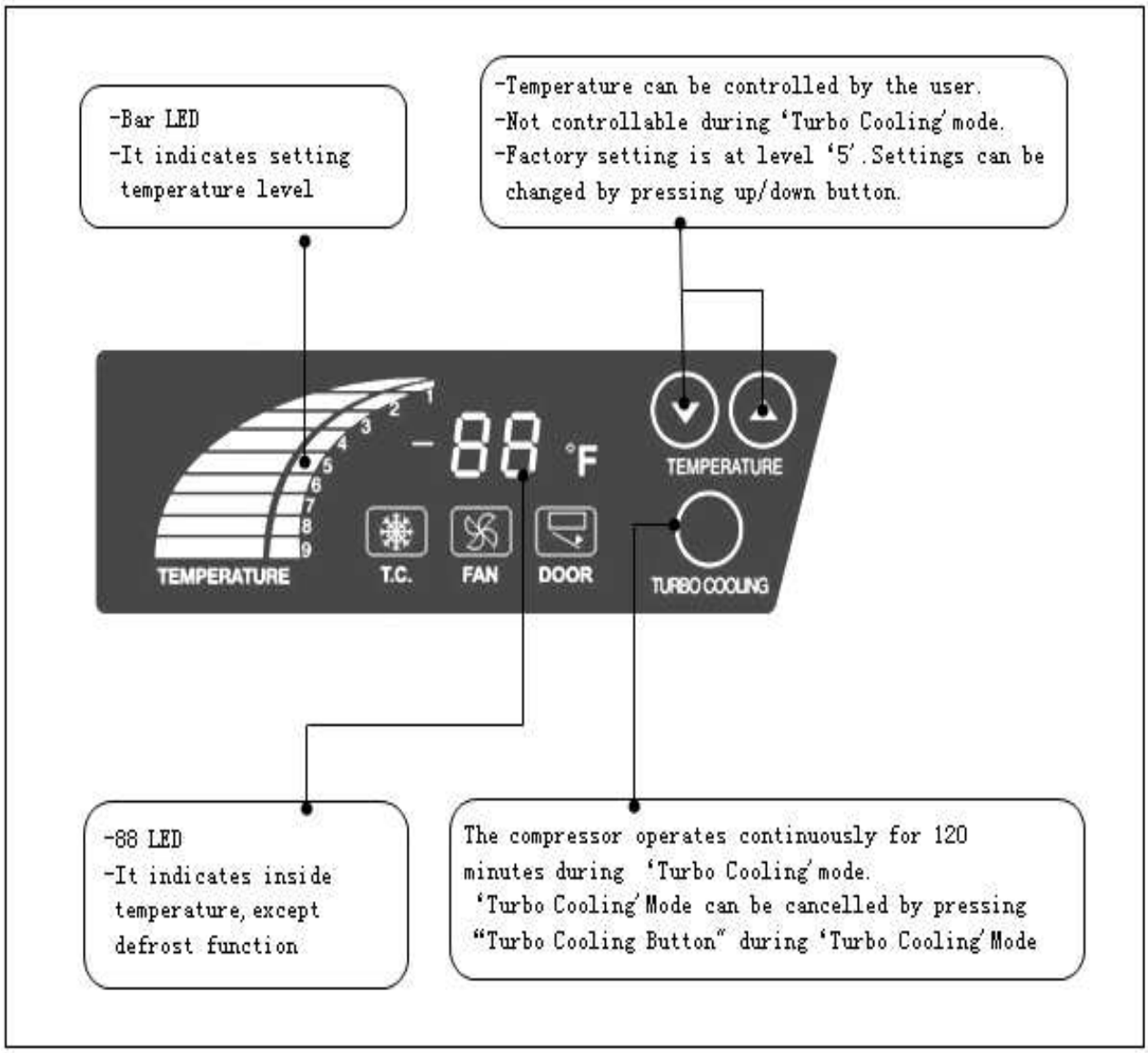
5-1-3.ERROR CODE TABLE

Code	Content	Perception Method	Refrigerator operation state
F1	F-sensor Malfunction	-short circuit -wire disconnection	-The comp. runs by periods. -Above action will repeat until fixed.
D1	D-sensor Malfunction	-short circuit -wire disconnection	-Heater turns on a regular basis Irrespective of D-sensor.
C1	Cycle, Comp Malfunction		-Normal operation
F3	Defrost Malfunction		-Reattempt normal defrost function repeatedly.

ELECTRONIC CONTROLLER INSTRUCTION

5-2.FREEZER CONTROLLER

5-2-1.HOW TO USE THE PANEL



ELECTRONIC CONTROLLER INSTRUCTION

NO	FUCTION	Controlled Part	Description
1	Initial Operation	Buzzer ,Fan Or Door lamp Bar LED 88LED	1.Buzzer will ring 2 sec. after Plug-In. 2.88 LED displays micom version initially and does inside temperature in 2 sec. 3.Compressor runs ,if evaporator temperature is higher than 41.0° F(5.0° C).Compressor will run 3 minutes after plug-in, if eva. temperature is lower than 41.1° F(5.0° C)
2	Tempera-ture Control	Compressor F-fan C-fan LED	1.The temperature can be changed by pushing up/down buttons. 2.88LED displays inside temperature . 3.Buzzer buzzes 1 time whenever a button is pressed. 4.Compressor automatically turns on and off by D-sensor(Except error mode)
3	Turbo Cooling	Compressor F-fan C-fan LED	1.If Turbo Cooling button is pressed, Turbo Cooling mode will start. 2.If the Turbo Cooling button is pressed during Turbo Cooling mode, Turbo Cooling mode can be canceled. 3.During Turbo Cooling mode, the temperature control button will not affect the temperature control. 4.All bar LEDs are fully lighted during Turbo Cooling mode. *NOTE* D-sensor: Thermistor (Electrical resistance varies with temperature changing) ACT Like thermostat. Detect eva. coil's temp. Wire color blue. R-sensor: Thermistor Act like thermometer. Detect inside air temp. Wire color is white.

ELECTRONIC CONTROLLER INSTRUCTION

<table>
<tr><th>NO</th><th>FUCTION</th><th>Controlled Part</th><th>Description</th></tr>
<tr><td>4</td><td>Defrost Function</td><td>Heater
compressor
F-fan
C-fan</td><td>1.Defrost function is controlled by time interval setting.
2.Time interval can be set by shifting dip s/w on the PCB.
3.Time interval setting is as follows.

Dip Switch Cycle time
No.1 No.2 (hours)
0 0 12
1 0 10
0 1 8
1 1 6
4.Factory setting is 6 hours
5.The first defrost function will start at the half value of setting time.</td></tr>
<tr><td>5</td><td>Forced Defrost</td><td>Comp
F-fan
C-fan
Heater</td><td>a.Press and hold up/down button and press turbo freeze button 5 times.</td></tr>
<tr><td>6</td><td>Comp Res-tart Prevent</td><td>Comp
C-fan</td><td>1.After comp. is off, comp. will not start for 3 min, even though the F-sensor is at point.</td></tr>
<tr><td>7</td><td>Power Failure Back-Up Function</td><td>Comp
F-fan
C-fan</td><td>1.Compressor will not start for 3 min. after power failure.
2.F-fan is on.</td></tr>
<tr><td>8</td><td>Door opening Alarm function</td><td>Buzzer
LED</td><td>1.If door is opened ,fan goes off and lamp on.
2.If door is opened for more than 30 seconds ,chirpy sound alarm buzzes 3 time.
3.If door is opened for more than 60 seconds ,chirpy sound alarm buzzes 5 time.
4.If door is opened for more than 5 minutes ,chirpy sound alarm buzzes continuously</td></tr>
<tr><td>9</td><td>Buzzer Function</td><td>Buzzer</td><td>1.Alam buzzers 1 time after initial power on.
2.Alam buzzers whenever each button is pressed.
3.Alam buzzers if door remains open for certain period.(See door opening alarm function).</td></tr>
<tr><td>10</td><td>Error Display</td><td>LED</td><td>1.If inside temp. is lower than -50° F or higher than 69,88LED indicates ‘Lo’ or ‘Hi’
respectively.
2.Press ‘up’ button 5 times with pressing and holding both ‘down’ button and ‘Turbo Cooling’ button .Above procedure switches normal display mode.
3.If there was no error occurred before, there will be no change on the 88 LED. If there was any error occurred before ,there will display error code.
4.Next error code will be displayed by pressing down button.
5.10 seconds after the last button pressed, error display mode will be switch to normal display mode.</td></tr>
</table>

5-2-3.ERROR CODE TABLE

Code	Content	Perception Method	Refrigerator operation state
F1	F-sensor Malfunction	-short circuit -wire disconnection	-The comp runs by periods -Above action will repeat until fixed
D1	D-sensor Malfunction	-short circuit -wire disconnection	-Heater turns on a regular basis Irrespective of D-sensor
C1	Cycle, Comp Malfunction		-Normal operation
F3	Defrost Malfunction		-Reattempt normal defrost function repeatedly.

6.PARTS LIST FOR TOP MOUNT

Part Name	Part Code	Material	SPEC	Model							
				R-23S	F-23S	R-35S	F-35S	R-49S	F-49S	R-72S	F-72S
Caster											
CASTER BOX ASS'Y	P8F0800300									1	1
CASTER BOX ASS'Y	P8F0800400			1	1	1	1	1	1		
Compressor											
COMPRESSOR RUN CAPACITOR											
COMPRESSOR START CAPACITOR											
COMPRESSOR	G2F5700100		CSIR (CAJ 2420Z)		1						
COMPRESSOR	M369700100		CSR HBL-27YE-1 (1/4HP)	1							
COMPRESSOR	M609700100		CSR SK1A1C-L2W (1/3HP)			1		1			
COMPRESSOR	P2F5700100		CSR (CAJ2432Z)				1		1		
COMPRESSOR	P5F5700100		CSR (CAJ2446Z)								1
COMPRESSOR	P8R5700100		CSIR (CAJ4476Y)							1	
COMPRESSOR POWER CORD (HARNESS RELAY)	T2F5100301			1							
COMPRESSOR POWER CORD (HARNESS RELAY)	T3F5100200						1				
COMPRESSOR POWER CORD (HARNESS RELAY)	T3R5100200					1					
COMPRESSOR POWER CORD (HARNESS RELAY)	T5R5100101							1			
COMPRESSOR POWER CORD (HARNESS RELAY)	T8F5100101										1
COMPRESSOR POWER CORD (HARNESS RELAY)	T8R5100101				1				1	1	
POWER RELAY (COMP.RELAY)	P995900200		LS 산전	1	1	1	1	1	1	1	1
ELECTRICAL BOX HARNESS (HARNESS MIDDLE)	T5R5100300			1		1		1			
ELECTRICAL BOX HARNESS (HARNESS MIDDLE)	T8F5100300										1
ELECTRICAL BOX HARNESS (HARNESS MIDDLE)	T8R5100300						1		1	1	
MAIN POWER CORD	T8F5800200										1
MAIN POWER CORD	T8R5800100			1	1	1	1	1	1	1	
Condenser											
CONDENSER COIL	G2F4500103	CU			1						
CONDENSER COIL	G2R4500102	CU		1							

PARTS LIST FOR TOP MOUNT

Part Name	Part Code	Material	SPEC	Model							
				R-23S	F-23S	R-35S	F-35S	R-49S	F-49S	R-72S	F-72S
CONDENSER COIL	G5R4500102	CU				1		1			
CONDENSER COIL	G8F4500102	CU									1
CONDENSER COIL	G8R4500102	CU					1		1	1	
SUCTION PIPE (B)	T2F4200401	CU			1						
SUCTION PIPE (B)	T2R4200301	CU		1							
SUCTION PIPE (B)	T3F4200100	CU					1				
SUCTION PIPE (B)	T3R4200300	CU				1					
SUCTION PIPE (B)	T5R4200301	CU						1			
SUCTION PIPE (B)	T8F4200301	CU							1		1
SUCTION PIPE (B)	T8R4200201	CU								1	
HARD CORE DRYER	M726800100			1	1	1	1	1	1	1	1
Condenser Fan											
CONDENSER FAN MOTOR BLADE	30218B0100, P8F2700300	AL	CCW 흡입 225	1		1		1			2
CONDENSER FAN MOTOR BLADE	30218A0100, G8F2700500	AL	CCW 흡입 250		1		1		1	1	
CONDENSER FAN MOTOR	3963220410, G8F6600100		IS 4420DWSG-1 (CCW) (115V-47W)	1	1	1	1	1	1	1	
CONDENSER FAN MOTOR	3963322020, G8F6600200		IS 4420DWSQ-1 (CCW) (220V-43W)								2
Door											
DOOR BUSHING	3007H1000, B1R0500500	NY66		1	1	2	2	2	2	3	3
DOOR BUSHING	T8F0500700	NY66		1	1	2	2	2	2	3	3
ASS'Y DOOR PANEL (L)	T3F0500200					1	1				
ASS'Y DOOR PANEL (L)	T5F0500200							1	1	1	1
ASS'Y DOOR PANEL (M)	T8F0500100									1	1
ASS'Y DOOR PANEL (R)	T2F0500100			1	1						
ASS'Y DOOR PANEL (R)	T3F0500100					1	1				
ASS'Y DOOR PANEL (R)	T5F0500100							1	1	1	1
DOOR GASKET	T3F0500300	PVC				2	2				
DOOR GASKET	T8F0500401	PVC		1	1			2	2	3	3
DOOR HINGE SPRING (SPRING BAR)	T3F0500500	SWRM	φ3.5			2	2				
DOOR HINGE SPRING (SPRING BAR)	T8F0500600	SWRM	φ3.8	1	1			2	2	3	3
DOOR CUSHION	T8F9900601	RUBBER			1		2		2		3
DOOR STOPER (B)	B1R0500600	SUS304-2B		1	1	2	2	2	2	3	3
DOOR STOPPER SPACE	T8F2900700	CR								2	2

PARTS LIST FOR TOP MOUNT

Part Name	Part Code	Material	SPEC	Model							
				R-23S	F-23S	R-35S	F-35S	R-49S	F-49S	R-72S	F-72S
CABINET HEATER	T2F5300100	PVC	L=3700, 54W		1						
CABINET HEATER	T2R5300100	PVC	L=3700, 43.7W	1							
CABINET HEATER	T3F5300300	PVC					1				
CABINET HEATER	T3R5300100	PVC				1					
CABINET HEATER	T5F5300100	PVC	L=5100, 74.5W						1		
CABINET HEATER	T5R5300100	PVC	L=5100, 60.2W					1			
CABINET HEATER	T8F5300200	PVC	L=6490, 94.8W								1
CABINET HEATER	T8R5300200	PVC	L=6490, 76.6W							1	
MULLION COVER (A)	T8F1200600	SUS439-#4				1	1	1	1		
MULLION COVER (B)	T8F1200500	SUS439-#4								1	1
MULLION HEATER (VER)	T8F5300101	PVC	L=2530, 28.6W				1		1		2
MULLION HEATER (VER)	T8R5300101	PVC	L=2530, 21W			1		1		2	
DOOR HINGE TOP ASSEMBLY LEFT	T8F2900300	CR				1	1	1	1	2	2
DOOR HINGE TOP ASSEMBLY RIGHT	T8F2900400	CR		1	1	1	1	1	1	2	2
TOP HINGE SPACER	T8F2900500	PVC		1	1	2	2	2	2	3	3
DOOR HINGE BOTTOM ASSEMBLY LEFT	T8F2900100	SUS304-2B				1	1	1	1	1	1
DOOR HINGE BOTTOM ASSEMBLY RIGHT	T8F2900200	SUS304-2B		1	1	1	1	1	1	2	2
BOTTOM HINGE SPACE	T8F2900600	PVC		1	1	2	2	2	2	3	3
Drain											
DRAIN PAN	30211A0202	PP	2t			1	1	1	1	1	1
DRAIN CASE	T2F1900100	ABS		1	1						
DRAIN WICKING BAR (SOP PAPER FIXTURE)	T2F0400400	ABS		1	1						
DRAIN WICKING BAR (SOP PAPER FIXTURE)	T8F0400700	ABS				1	1	1	1	1	1
DRAIN WICKING PADS (SOP PAPER)	T2F0400500	PAPER		4	4						
DRAIN WICKING PADS (SOP PAPER)	T8F0400800	PAPER				4	4	4	4	4	4
Evaporator											
DRAIN CONNECTOR A	G8F3200601	NY66		1	1	1	1	1	1	1	1
DRAIN CONNECTOR B	G8F3200700	NY66		1	1	1	1	1	1	1	1
EVAPORATOR DRAIN PAN	G2F2700100	AL		1	1						
EVAPORATOR DRAIN PAN	T3F2700100	AL				1	1				
EVAPORATOR DRAIN PAN	G5F2700101	AL						1	1		
EVAPORATOR DRAIN PAN	G8F2700100	AL								1	1

PARTS LIST FOR TOP MOUNT

Part Name	Part Code	Material	SPEC	Model							
				R-23S	F-23S	R-35S	F-35S	R-49S	F-49S	R-72S	F-72S
EVAP COIL	G2F4400104	CU			1						
EVAP COIL	G2R4400101	CU		1							
EVAP COIL	T3F4400100	CU					1				
EVAP COIL	T3R4400100	CU				1					
EVAP COIL	G5F4400103	CU							1		
EVAP COIL	G5R4400101	CU						1			
EVAP COIL	G8F4400101	CU									1
EVAP COIL	G8R4400101	CU								1	
DEFROST HEATER	T2F5300300	SUS-PIPE	445W		1						
DEFROST HEATER	T3F5300100	SUS-PIPE					1				
DEFROST HEATER	T5F5300300	SUS-PIPE	600W						1		
DEFROST HEATER	T8F5300500	SUS-PIPE	900W								1
DEFROST FIXTURE SPRING	G8F9900101	SUS304			12		12		12		12
EVAPORATOR SENSOR (THERMISTOR ASSY)	T8F6200101		D-SENSOR, F-SENSOR		1		1		1		1
EVAPORATOR SENSOR (THERMISTOR ASSY)	T8R6200101		D-SENSOR, R-SENSOR	1		1		1		1	
EVAPORATOR THERMAL FUSE	T8F6200200		115V 60Hz 80 도		1		1		1		1
EVAPORATOR DRAIN PAN HEATER	T2F5300200	PVC&AL	L=3460, 61.2W		1						
EVAPORATOR DRAIN PAN HEATER	T3F5300200	PVC&AL					1				
EVAPORATOR DRAIN PAN HEATER	T5F5300200	PVC&AL	L=5060, 90W						1		
EVAPORATOR DRAIN PAN HEATER	T8F5300400	PVC&AL	L=6260, 111.1W								1
DRAIN HOSE HEATER	T8F5300300		L=700, 10W		1		1		1		1
DRAIN PAN INSULATOR (DRAIN GUIDE PAD)	G8F7300100	F-PS								1	1
DRAIN PAN INSULATOR (DRAIN GUIDE PAD)	G5F7300100	F-PS						1	1		
DRAIN PAN INSULATOR (DRAIN GUIDE PAD)	G2F7300100	F-PS		1	1						
DRAIN PAN INSULATOR (DRAIN GUIDE PAD)	T3F7300100	F-PS				1	1				
EVAPORATOR FAN MOTOR GUARD	G8F3200501	ABS		1	1	2	2	2	2	3	3
EVAPORATOR FAN MOTOR BLADE	P8F2700400	AL	CW 흡입 175	1	1	2	2	2	2	2	2
EVAPORATOR FAN MOTOR	3963328120, P8F6600100		IS 4420DWSN-2A (CW) (43W)	1	1	2	2	2	2	2	2
DUCT (A),(EVAP HOUSING COVER (F))	T3F1700300	AL					1				
DUCT (A),(EVAP HOUSING COVER (F))	T3F1700200	AL				1					
DUCT (A),(EVAP HOUSING COVER (F))	G5F1700101	AL						1	1		
DUCT (A),(EVAP HOUSING COVER (F))	T2F1700100	AL		1	1						
DUCT (A),(EVAP HOUSING COVER (F))	T8F1700100	AL								1	1
DUCT (B),(EVAP HOUSING COVER (B))	T2F1700200	AL		1	1						
DUCT (B),(EVAP HOUSING COVER (B))	T3F1700100	AL				1	1				
DUCT (B),(EVAP HOUSING COVER (B))	G5F1700200	AL						1	1		
DUCT (B),(EVAP HOUSING COVER (B))	G8F1700200	AL								1	1

PARTS LIST FOR TOP MOUNT

Part Name	Part Code	Material	SPEC	Model							
				R-23S	F-23S	R-35S	F-35S	R-49S	F-49S	R-72S	F-72S
Top Grille Panel											
TOP GRILLE PANEL ASSEMBLY	T2F0600200		0		1						
TOP GRILLE PANEL ASSEMBLY	T2R0600100			1							
TOP GRILLE PANEL ASSEMBLY	T3F0600500						1				
TOP GRILLE PANEL ASSEMBLY	T3R0600100					1					
TOP GRILLE PANEL ASSEMBLY	T5F0600200		0						1		
TOP GRILLE PANEL ASSEMBLY	T5R0600100							1			
TOP GRILLE PANEL ASSEMBLY	T8F0600500										1
TOP GRILLE PANEL ASSEMBLY	T8R0600100									1	
BRAND LOGO(F)	T8F0900100	ABS			1		1		1		1
BRAND LOGO(R)	T8F1600800	ABS		1		1		1		1	
TOP GRILLE	T2F0600101		SUS439-2B		1						
TOP GRILLE	T3F1600100		SUS439-#4			1	1				
TOP GRILLE	T5F0600101		SUS439-2B					1	1		
HARNESS DISPLAY PCB	P8F5101201			1	1	1	1	1	1	1	1
FRONT PCB CASE FILM (F)	30235L0100, P8F7400100				1		1		1		1
FRONT PCB CASE FILM (R)	30235Q0900, P8R7400100			1		1		1		1	
KEY	P998200100			1	1	2	2	2	2	3	3
DISPLAY PCB	P995400100			1		1		1		1	
DISPLAY PCB	P8F5400200				1		1		1		1
MAIN PCB (F)	P8F5400100				1		1		1		1
MAIN PCB (R)	P8R5400100			1		1		1		1	
TRANS FORMER	P996000100			1	1	1	1	1	1	1	1
POWER SWITCH	30281Q0100			1	1	1	1	1	1	1	1
DOOR SWITCH	P995200100			1	1	2	2	2	2	3	3
Bottom Grille											
BOTTOM GRILLE ASSEMBLY	T2F1600100			1	1						
BOTTOM GRILLE ASSEMBLY	T3F0600600					1	1				
BOTTOM GRILLE ASSEMBLY	T5F1600100							1	1		
BOTTOM GRILLE ASSEMBLY	T8F1600100									1	1
Lamp											
LAMP COVER	G8F3200203		PC	1	1	1	1	1	1	1	1
LAMP BULB	P996300100			1	1	1	1	1	1	2	2
LAMP SOCKET	P996400100	ABS		1	1	1	1	1	1	1	1

PARTS LIST FOR TOP MOUNT

Part Name	Part Code	Material	SPEC	Model							
				R-23S	F-23S	R-35S	F-35S	R-49S	F-49S	R-72S	F-72S
Shelf											
SHELF CLIP	P993200800	PA-66	Natural	16	16	26	26	32	32	48	48
SHELF	T2F1800101	SUS304		3	3						
SHELF	T3F1800100	SUS304				6	6				
SHELF	T5F1800100	SUS304						6	6	9	
SHELF	T8F1800200	SUS304									9

8. REPLACEMENTOFMAINCOMPONENTS

7-1. TOP GRILLE PARTS

- MAIN PCB or TRANSFORMER
- DISPLAY PCB
- DOOR LOCK or POWER SWITCH (ROCKER SWITCH)
- DOOR SWITCH

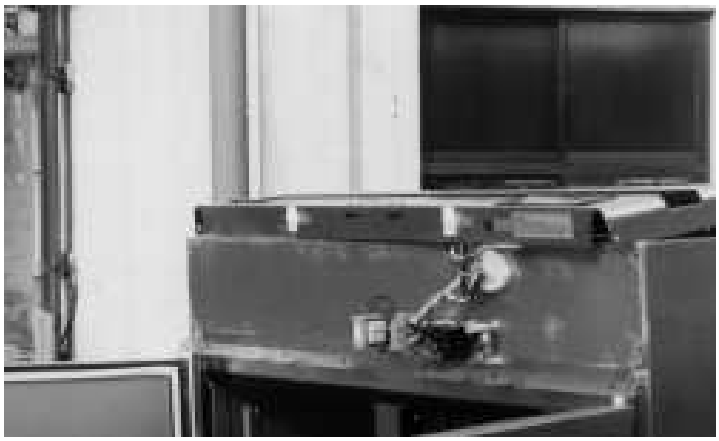
A. Unscrew the screw located both sides of top grille panel.

B. Unscrew the screws located on top of top grille panel.

C. Unscrew the screws located on bottom of top grille panel.

* Caution ： When unscrewing, hold the top grille panel.
Falling down top grille may cause bruise.

D. Place the top grille panel on the top of the cabinet.



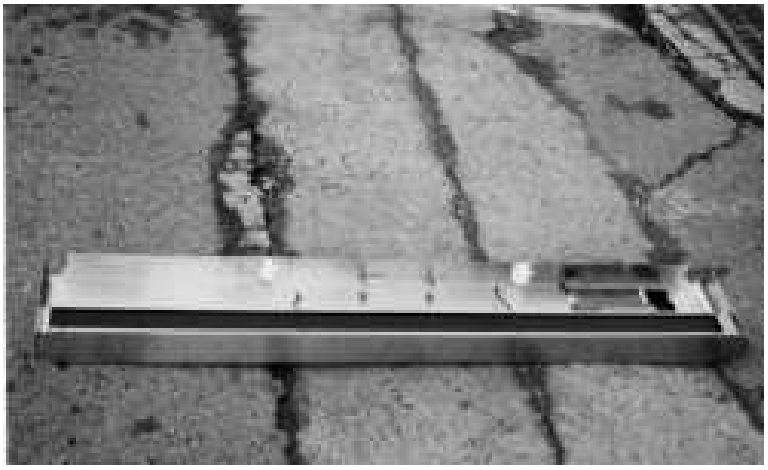
E. You can replace PCB transformer.

F. Pull out the harness located back of top grille panel.

You can separate top grille panel.

You can replace power switch (rocker switch), door switches (lamp switch) and control board housing

G. To re-assemble, do reversed in order.



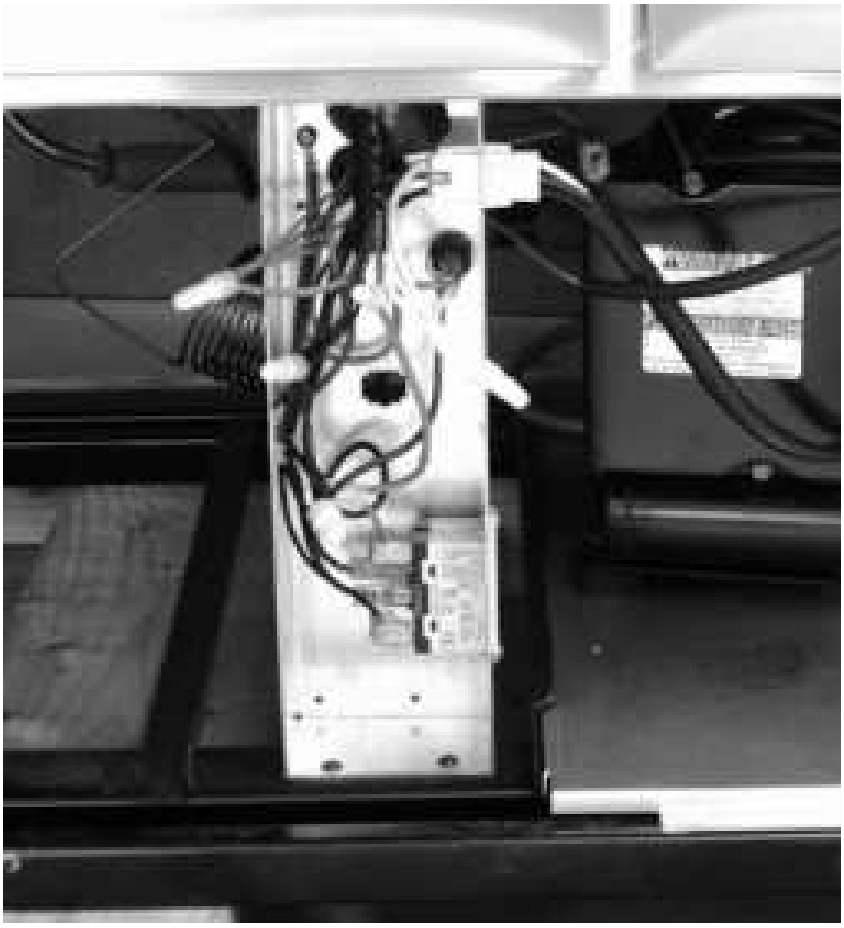
REPLACEMENT OF MAIN COMPONENTS

7-2. REPLACING DOOR

A. Disassemble top grille panel as described section 7-1 A.B.C.D.

B. Remove Bottom Grille by unscrewing the four screws located on each side of The Bottom Grille.

C. Open the electrical box. Then uncap the door heater wire. (Freezer model only)



REPLACEMENT OF MAIN COMPONENTS

D. The figure of the disassembled top grille panel.

E. Unscrew the hinge

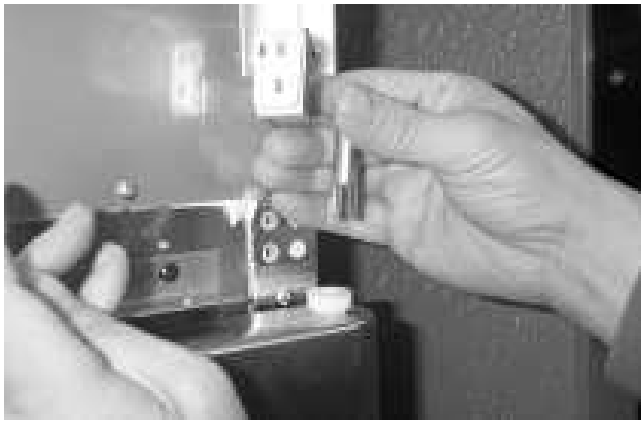
F. Unscrew the last screw with pushing the hinge.

G. After unscrewing, the hinge will rotate about 90℃(CCW), of itself.

REPLACEMENT OF MAIN COMPONENTS

H. Lift the door and pull out the door heater's lead wire.

I. Replace the door with the new one



J. Ready the hinge as below. It is important to set initial position (angle).

REPLACEMENT OF MAIN COMPONENTS

K. Initial position of the hinge must be as below.

L. Turn the hinge 90°CW. This turning cause torsio n strength of the bar spring that shuts the door(s) automatically.

M. Screw the hinge with pushing it. After installation of the door(s), assemble the top grille panel.

7-3. REFRIGERATION COMPARTMENT'S PARTS

A. Disassemble lamp shield.

- LAMP BULB or LAMP SHIELD
- EVAPORATOR FAN MOTOR
- F/D SENSOR or R/D SENSOR
- EVAPORATOR DEFROST HEATER
- EVAPORATOR COIL

B. Disassemble Duct (A).

C. Pull out the lamp harness.

REPLACEMENT OF MAIN COMPONENTS

D. Disassemble duct (B).

E. Pull-out the evaporator drain pan heater's lead wire.

F. Figure of disassembled refrigeration compartments

In this situation, you can replace fan motor, F/D-sensor, Evaporator coil, ETC

REPLACEMENT OF MAIN COMPONENTS

G. Replacing evaporator fan motor

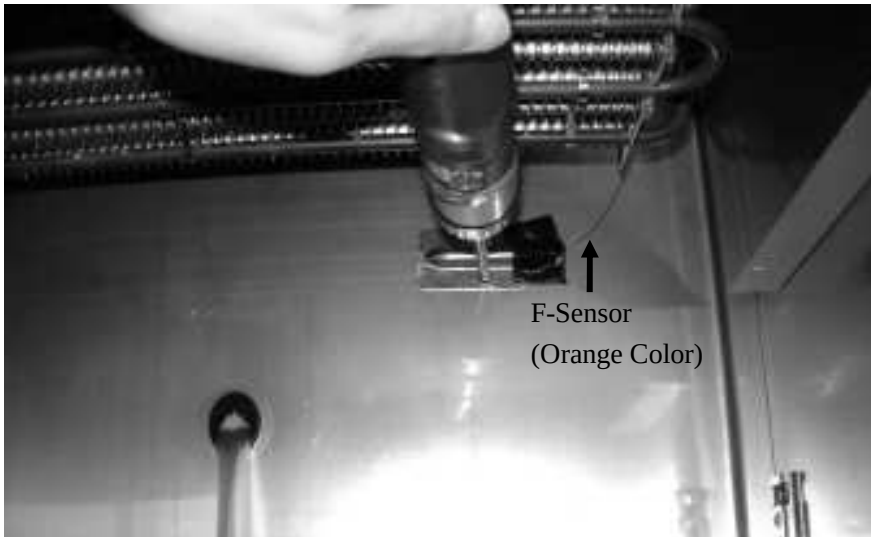
G-1 . Pull out the fan motor's connector.

G-2 . Unscrew the four screws which located on bottom of fan motor

H. Replacing F/D-Sensor or R/D-Sensor

H-1. F-Sensor of Freezer

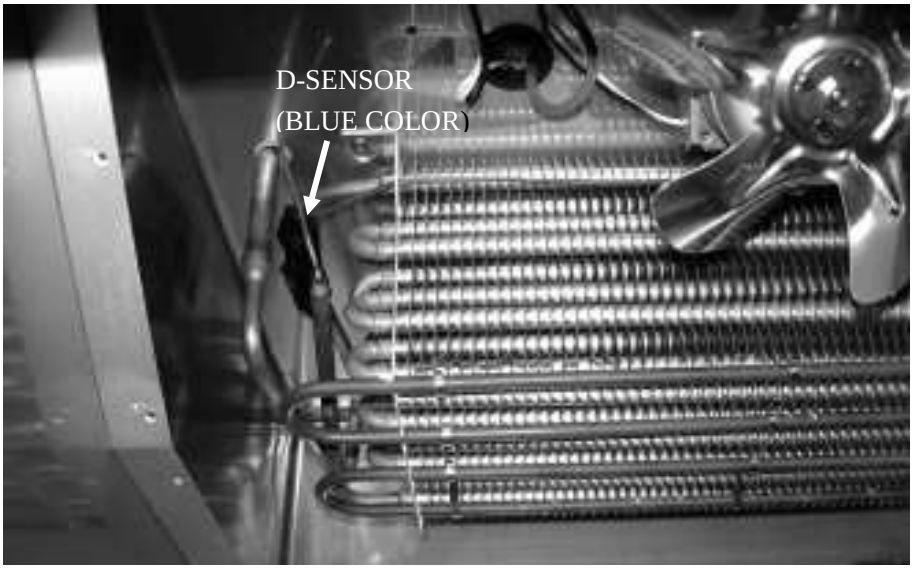
Unscrew as illustrated below and pull-out the F-Sensor from the cover



REPLACEMENT OF MAIN COMPONENTS

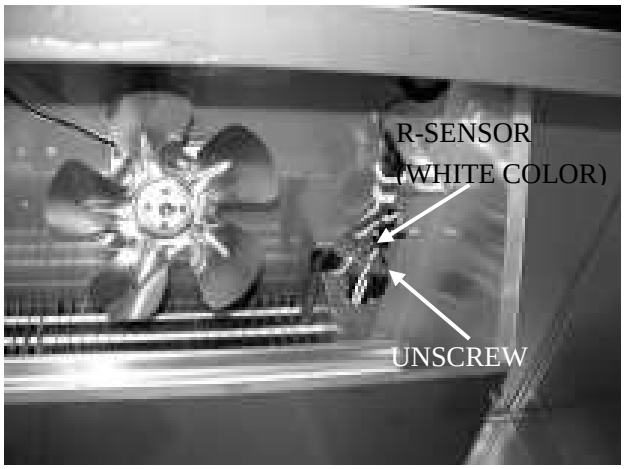
H-2. D-Sensor of Freezer (Evaporator Defrost Sensor)

Disassemble the D-Sensor from evaporator's end plate.2

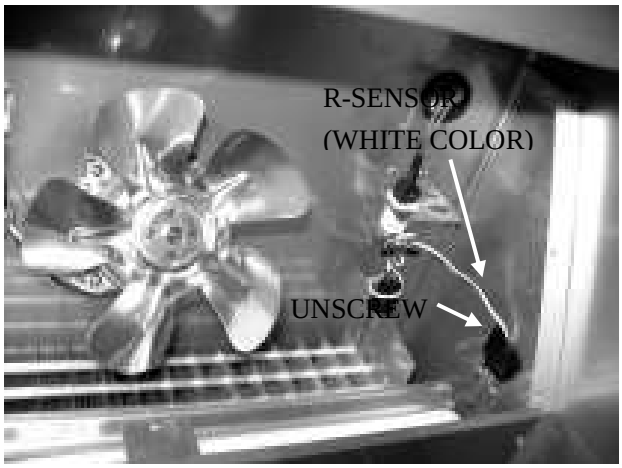


H-3. R-Sensor of Refrigerator

Unscrew as illustrated below and pull-out the R-Sensor from the cover.



TSR-35SD
TSR-49SD
TSR-72SD

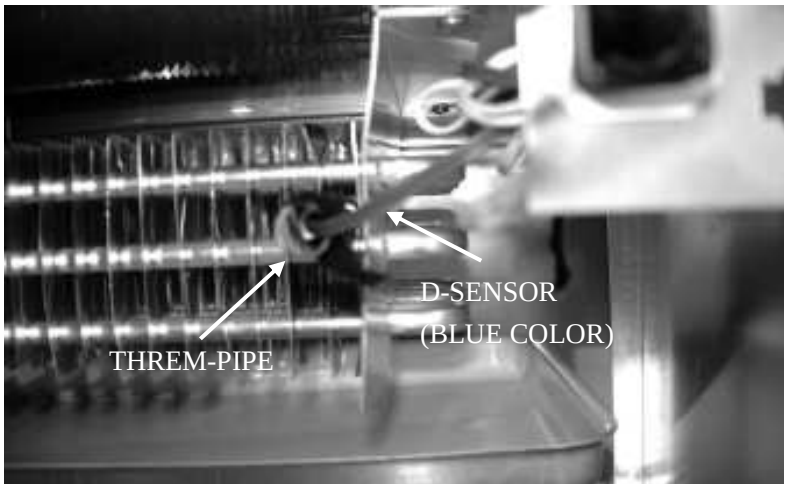


TSR-23SD

REPLACEMENT OF MAIN COMPONENTS

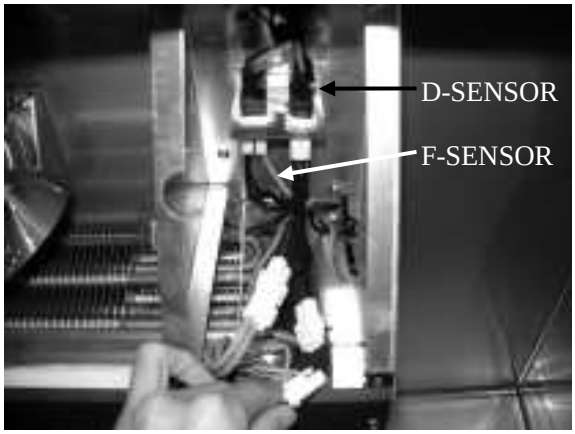
H-4. D-Sensor of Refrigerator

Remove the absorber pad at the end of thermo-pipe and pull-out the D-Sensor.

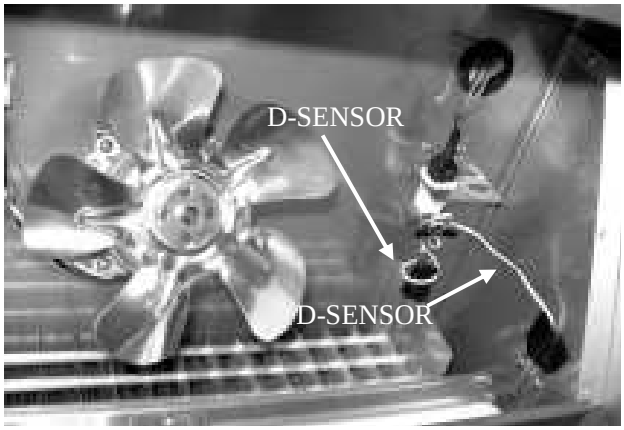


H-5. F/D Sensor or R/D Sensor

After unplug each sensor, pull-out the sensor's lead wire.



F/D Sensor
(F-Sensor : Orange Color,
D-Sensor : Blue Color)



R/D Sensor
(R-Sensor : White Color,
D-Sensor : Blue Color)

REPLACEMENT OF MAIN COMPONENTS

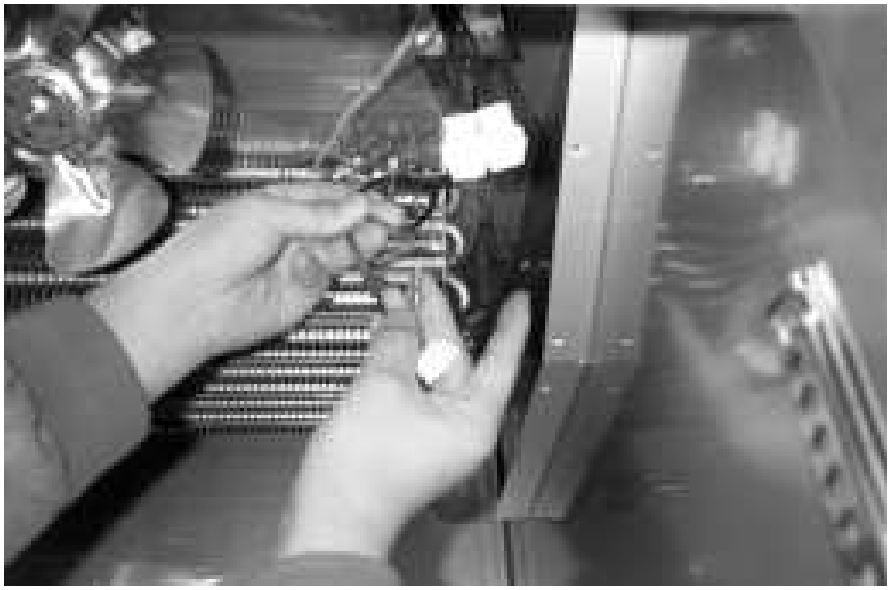
A. After disassembling the duct (A) and the duct (B), get ready as below for replacing the evaporator defrost heater.

B. Pull out the pins from the bottom of the evaporator using the nipper, etc.

C. Split the hooks of the evaporator.

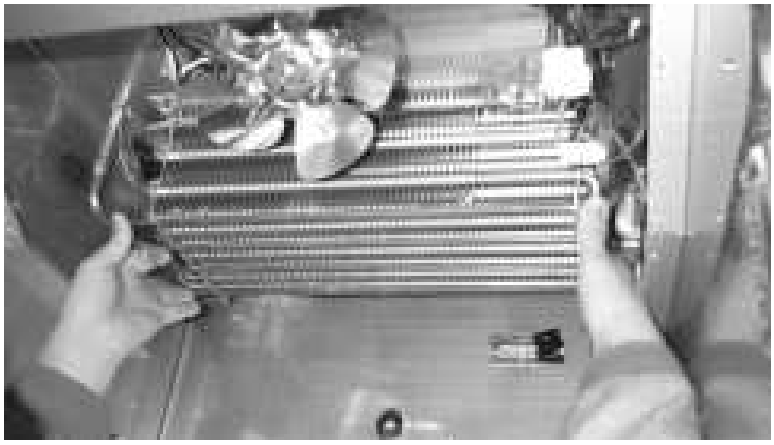
REPLACEMENT OF MAIN COMPONENTS

D. After removing all pins, disconnect the connectors from the thermal fuse and the main

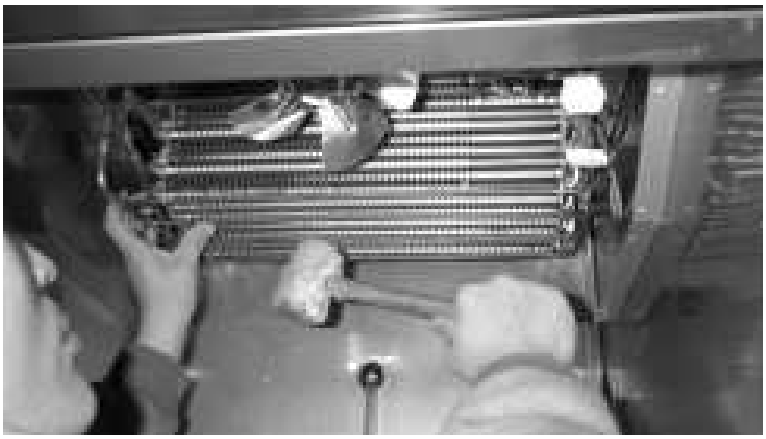


E. Take apart the evaporator defrost heater from the evaporator.

F. Install the new evaporator defrost heater in original position.



G. Pat the evaporator defrost heater with the soft hammer.



H. Pinch the hooks of the evaporator.

REPLACEMENT OF MAIN COMPONENTS

I . Assemble the pins in original positions.

J. Connect the connectors of the evaporator defrost heater to them of the thermal fuse and the main harness.

*** NOTE**

Why is always 115 voltage detected between connectors of the evaporator defrost heater

in the main harness?

The SNUBBER (located Main PCB) holds two AC power lines simultaneously.
The SNUBBER prevents Main PCB malfunction from sparks occurred by other electrical component's ON/OFF. (SNUBBER = Spark killer)
Because of the SNUBBER, 115 voltage is always detected, but electrical current in this case is very little(small Amps.). So, this electrical current is not enough to operate the evaporator defrost heater.

How to measure the Amps of a evaporator defrost heater.

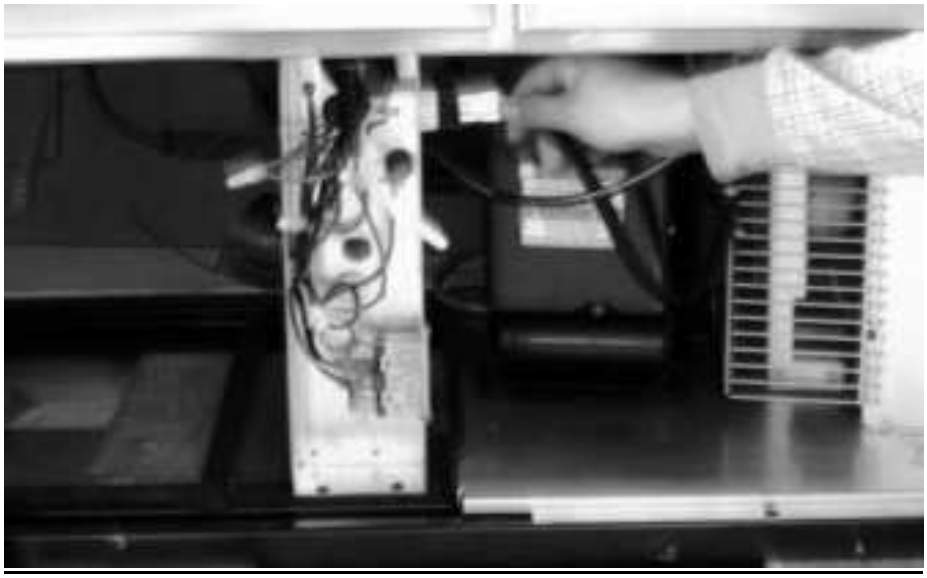
Disconnect the connectors of the evaporator defrost heater.
Then, prepare the additional Power Source (115V/60Hz) and the Amp. Meter.
Connect the evaporator defrost heater to the additional power source and read amp. value from the Amp. Meter.

7-4. CONDENSING UNIT

- Condensing Units : Compressor, Condenser Fan Motor, Condenser Coil, Condenser Dryer....
- Others : Compressor Power Cord (Relay harness), Main Power Cord, Electrical Box, ETC.

A. Disassemble Bottom Grille as described section 7-2. B.
B. Unscrew two screws as below.

C. Unplug the compressor's power plug



D. Pull-out the condensing unit

7-5. REPLACING CABINET FRAME HEATER (and/or) MULLION HEATER

A. Insert the and edge of '–'type screw driver into the gap between the frame and the frame cover.

B. Take apart the frame cover from the frame.

C. Separate the frame cover by sliding the screw driver.

D. Do just like above instructions in other parts (bottom side, right side and top

REPLACEMENT OF MAIN COMPONENTS

E. Below picture shows the inlet of the cabinet frame heater toward the electrical box.

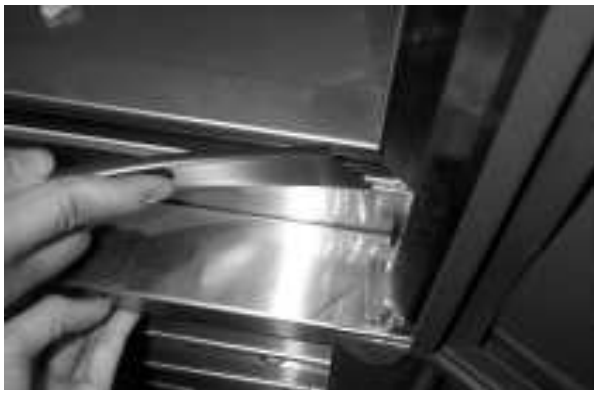
F. Uncap connectors of the cabinet frame heater.

G. Pull out the heater wire from the inlet.

H. Insert the new cabinet frame heater wire to the inlet, after surrounding it along the frame.

REPLACEMENT OF MAIN COMPONENTS

I. Assemble the frame cover with the frame. Push and slide the frame cover toward corner.



J. Fit the end lines of the frame cover Each other.

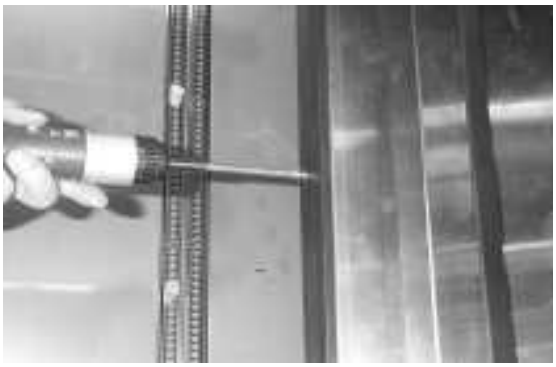
K. Fit the other side of the frame cover, too.

L. Pat the frame cover with the soft hammer, etc.

M. Do like above instructions in other parts (Left side, right side and top side).

REPLACEMENT OF MAIN COMPONENTS

N. Unscrew the screws from the mullion.



O. Take apart the mullion cover from the mullion.

P. Take care for the mullion heater not to be hurt. (It does not matter, if this heater is out of order).

REPLACEMENT OF MAIN COMPONENTS

Q. Pull out the insulator from inside.

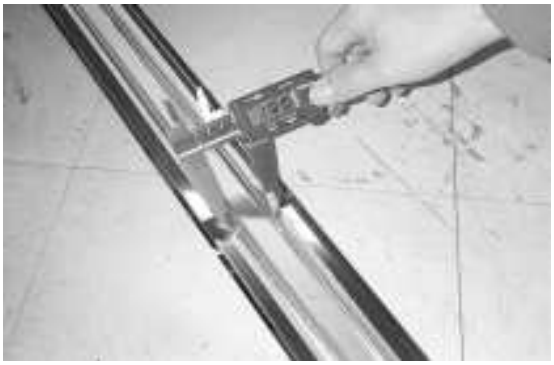
R. Uncap connectors of the mullion heater.

S. Pull out the heater wire from the inlet

REPLACEMENT OF MAIN COMPONENTS

T. Pull out the mullion cover(SUS) from the mullion cover (ABS).

U. Change the old mullion heater and install the new one with the gap between wires 1.2 inch.



V. Insert the mullion cover(SUS) into the original position.

REPLACEMENT OF MAIN COMPONENTS

W. Connect the heater wires with the main harness and the electrical box harness

X. Cover the caps on the connection parts and press them tightly.